

Shaping Minds from the Start: How Babies' Brains Develop in the First Year of Life

About the AUTHOR

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The early years of life are not just a time of rapid physical development—they are also the most critical period for brain development.

— Center on the Developing Child, Harvard University (2023)



From the moment a baby is born, their brain begins an extraordinary journey of growth and transformation. As early years educators, we play a critical role in shaping this journey through the everyday interactions we have with the babies in our care. This blog explores what current neuroscience tells us about how babies' brains are built in the first year of life and how we shape the process through our practice with babies.

Building Brain Architecture: Neurons, Synapses and 'Serve and Return'

At birth, babies already have all the neurons they will ever need—about 100 billion of them. But the real magic of the early years is in connectivity: over 1 million new synaptic connections are formed every second during a baby's early years.

The most powerful way to support early connectivity is through 'serve and return' interactions. A serve and return interaction happens when a baby babbles, smiles, or looks towards something (a 'serve'), and the adult responds by noticing the baby's serve and responding appropriately, such as through a facial expression, shared gaze, gentle touch or words.

A simple game of peekaboo with a 7-month-old is an excellent example of serve and return.

These aren't just playful moments; they are brain-building ones.



The Chemistry of Connection: Oxytocin

When we connect emotionally with babies, we're also influencing their brain chemistry.

Oxytocin, often called the "love hormone," is released during moments of affection and close physical contact. It is released in both the caregiver and the baby. It enhances feelings of bonding and trust—not only for the baby but for us, too. Holding a baby close during a bottle feed, or soothing them gently to sleep, often calms both baby and adult. That's oxytocin at work.



Oxytocin release in the first years of life shapes oxytocin receptivity for the rest of a baby's life. What this means for our practice with babies is that loving touch, warmth and 'professional love' are essential components of what we do. They are not optional add-ons and we need to interrogate any aspects of practice that get in the way of a loving and affection environment for babies.

Policies that direct baby room educators to be less affectionate (e.g. to only give cuddles when demanded by a crying baby) are unhelpful. In addition, stressful and exhausting working patterns and conditions inhibit adults' capacity to be warm and loving. This means that it is essential for teams to reflect together on regularly on the environment and culture of the baby room and think through challenges that make loving interactions with the babies more difficult or less likely.

Protecting Developing Brains from Toxic Stress

Not all stress is bad. In fact, short-term stress can build resilience. But toxic stress—prolonged, unrelieved stress—can be deeply damaging. It interferes with synaptic growth and can lead to long-term difficulties in emotional regulation and learning.

A key cause of toxic stress for babies is consistently unresponsive caregiving. Babies rely on adults not just to meet their needs but to help them calm down. Without this support, stress chemicals like cortisol remain elevated, eating away at the brain's developing circuits.

This is why it's so important to debunk the myth that babies can "self-soothe". They can't. But they can engage in co-regulation, where we lend them our 'upstairs brain' – that is, the executive network in the brain which can help to soothe the stress response. Co-regulation can happen through somato-sensory tools, such as swaying, humming and loving touch. It can also happen through cognitive tools, such as explaining back to a baby how they are behaving and what they might be feeling e.g. 'You're rubbing your eyes, I think you might be tired; don't worry – I'll hold you for now and we'll be heading to bed soon'.





Reflective Questions:



- ★ What was the last 'serve and return' interaction you enjoyed with a baby?
- ★ How is loving touch and affection part of your practice with babies?
- ★ What is your go-to co-regulation tool to soothe a baby experiencing a stress response?

Further Reading and Resources:

Guard, C. (2024) Thinking about babies: A Froebelian approach. Guidance for Leaders and Managers of Early Years Settings. Available online: [Froebel-Trust-Thinking-about-babies-Interactive.pdf](#)

Sakr, M. (2025) The Baby Room: A practical guide for early years educators. Available online: [The baby room: a practical guide for early years educators](#)

Sakr, M. (2025) Baby, what are you discovering? Available online: [Baby, what are you discovering? – Baby Rooms – Inspiring Leaders](#)

Department for Education: Getting it right from the start. Available online: [How early years practitioners work with babies and toddlers](#)

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For more information on Early Years best practice please access [The Thames Valley Early Years Stronger Practice Hub](#) resources including the Recorded Webinar on [Babies' Brains in the first year of life. By Dr Mona Sakr](#) or email admin@tveysph.org for more details and resources.

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